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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,188	02/08/2002	Tomoaki Yoshida	Q63028	8127
23373	7590	03/17/2004	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			CANTELMO, GREGG	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 03/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/049,188

Applicant(s)

YOSHIDA ET AL.

Examiner

Gregg Cantelmo

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 2-16 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 21-27 and 29030 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election of Group I, claims 1, 17-27 and 29-30 in the paper received February 26, 2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). The Examiner appreciates Applicant's modification of the species election so as not to include claims 2-15 which are not drawn to the gas diffusion layer. Accordingly claims 2-15 have been withdrawn as to the non-elected catalyst species.
2. Claims 2-16 and 28 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse as reasoned above.

### *Priority*

3. Acknowledgment is made of applicant's claim for foreign priority based applications filed in Japan on January 16, 2001 and July 30, 2001. It is noted, however, that applicant has not filed a certified copy of the Japanese applications as required by 35 U.S.C. 119(b).
4. This application claims benefit to a provisional application No. 60/267,412, filed on February 9, 2001, in a language other than English. Applications that claim benefit of a provisional application filed in a non-English language must include an English

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translation of the non-English language provisional application and a statement that the translation is accurate. See 37 CFR 1.78(a)(5). The English translation and a statement that the translation is accurate as required by 37 CFR 1.78(a)(5) is missing. Applicant must supply the missing English translation and a statement that the translation is accurate in the reply to this Office action prior to the expiration of the time period set in this Office action.

5. This application claims benefit to a provisional application No. 60/308,855, filed on August 1, 2001, in a language other than English. Applications that claim benefit of a provisional application filed in a non-English language must include an English translation of the non-English language provisional application and a statement that the translation is accurate. See 37 CFR 1.78(a)(5). The English translation and a statement that the translation is accurate as required by 37 CFR 1.78(a)(5) is missing. Applicant must supply the missing English translation and a statement that the translation is accurate in the reply to this Office action prior to the expiration of the time period set in this Office action.

#### ***Information Disclosure Statement***

6. The information disclosure statement filed July 30, 2002 has been placed in the application file and the information referred to therein has been considered as to the merits.

***Drawings***

7. The drawings received February 8, 2002 are acceptable for examination purposes.

***Claim Objections***

8. Claims 21-27, 29 and 30 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend on a previous multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "or an assembly used therefor" is not defined and it is unclear what this phrase pertains to.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1, 17 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 60-074354 A (JP '354).

JP '345 discloses a fuel cell electrode for a fuel cell (a fuel cell inherently comprising an electrolyte sandwiched between electrodes. Each electrode comprises a catalyst layer 4 and a gas diffusion layer A, wherein the gas diffusion layer A contains a water repellant fluoride resin and carbon fibers (abstract) and the surface of the gas diffusion layer A is in contact with catalyst layer 4 (Figs 2-3 as applied to claim 1).

The electrodes shown in Figs. 2-3 are disposed about an electrolyte membrane, thereby forming a MEA. At least a portion of the surface of the gas diffusion layer A, which is in contact with catalyst layer 4, includes a layer containing a hydrophobic fluoride resin and fibrous carbon (abstract and Figs. 2-3 as applied to claim 17).

The gas diffusion layer has spaces formed therein (abstract and Figs. 2-3 as applied to claim 19).

13. Claims 1, 17 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent No. 5,677,074 (Serpico).

Serpico discloses a fuel cell electrode for a fuel cell, the fuel cell comprising an electrolyte sandwiched between electrodes (col. 6, ll. 62-65). Each electrode comprises a catalyst layer 5 and a gas diffusion layer 3, wherein the gas diffusion layer 3 contains a water repellant binder resin and carbon fibers (col. 2, ll. 48-51) and the surface of the gas diffusion layer 3 is in contact with catalyst layer 5 (Fig. 1 as applied to claim 1).

The electrodes shown in Figs. 1 and 2 are disposed about an electrolyte membrane, thereby forming a MEA (col. 6, ll. 62-65). At least a portion of the surface of the gas diffusion layer 3, which is in contact with catalyst layer 5, includes a layer containing a hydrophobic binder resin and fibrous carbon (col. 2, ll. 48-51 and Fig. 1 as applied to claim 17).

The gas diffusion layer is porous, i.e., has spaces formed therein (col. 2, ll. 20-25 as applied to claim 19).

14. Claims 1, 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 869568-A (EP '568).

EP '568 discloses a fuel cell electrode for a fuel cell, the fuel cell comprising an electrolyte sandwiched between electrodes (Fig. 2). Each electrode 14 comprises a catalyst layer 14a and a gas diffusion layer 14b, wherein the gas diffusion layer 14b contains a water repellant binder resin and carbon fibers and the surface of the gas diffusion layer 14b is in contact with catalyst layer 14a (abstract and Figs. 1-2 as applied to claim 1).

The electrode shown in Fig. 2 is one of two which are disposed about an electrolyte membrane, thereby forming a MEA. At least a portion of the surface of the gas diffusion layer 14b, which is in contact with catalyst layer 14a, includes a layer containing a hydrophobic binder resin and fibrous carbon (abstract and Figs. 1-2 as applied to claim 17).

The gas diffusion layer additionally comprises carbon black particles, i.e. conductive powder particles (abstract as applied to claim 18).

The gas diffusion layer is porous, i.e., has spaces formed therein (Figure as applied to claim 19).

***Claim Rejections - 35 USC § 103***

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over either JP '354, Serpico or EP '568 in view of U.S. patent No. 4,440,617 (Solomon).

The teachings of JP '354, Serpico and EP '568 have been discussed above and are separately incorporated herein.

The difference between instant claim 20 and the prior art of either JP '354, Serpico or EP '568 is that none of these references appear to expressly teach of the porosity of the gas diffusion layer as defined in claim 20.

Each of JP '354, Serpico and EP '568 employ a porous gas diffusion layer in the electrode assembly. This arrangement is essential in permitting the transport of gas to the catalytic and electrolytic layers of the fuel cell so that the electrochemical reaction can occur across the fuel cell to generate electricity.

The dimensioning of the pores in the gas diffusion layer in the electrode is a result effective variable, one which would have been obvious to one of ordinary skill in



the art. Increasing the porosity increases the gas diffusion layer's gas diffusibility. Conversely reducing the porosity decreases the gas diffusion layer's gas diffusibility.

Solomon teaches that pore size in the gas diffusion electrode can be any dimension such that the pores are large enough to prevent the development of backup pressures high enough to cause bleeding in the backing layer. Essentially the size of the pores in the backing layer are not overly critical and are typically in the range of about 1-40 microns (col. 4, ll. 43-64).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of either JP '354, Serpico or EP '568 by optimizing the pore size and distribution to any desired level, including the arrangement as defined in claim 20, since it would have imparted a desired gas diffusion rate through the gas diffusion layer. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesche, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

Absent any clear evidence of criticality to the particular pore array of claim 20, and in light of the fact that optimizing the pore distribution is held to be a result-effective variable as reasoned above, the limitations of claim 20 are held to be obvious over the prior art of record.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (571) 272-1283. The examiner can normally be reached on Monday to Thursday from 9 a.m. to 6 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. FAXES received after 4 p.m. will not be processed until the following business day. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Gregg Cantelmo  
Patent Examiner  
Art Unit 1745

gc



March 11, 2004